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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,205	08/14/2001	Michael R. Strommen	56640US002	1202

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EXAMINER
TORRES VELAZQUEZ, NORCA LIZ

ART UNIT	PAPER NUMBER
1771	7

DATE MAILED: 03/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application N .	Applicant(s)	
	09/929,205	STROMMEN, MICHAEL R.	
	Examin r	Art Unit	
	Norca L. Torres-Velazquez	1771	

-- The MAILING DATE f this c mmunication appears n the cover sheet with the corresp ndence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5, 4.*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 9-10, 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over OGINO et al. (US 4,411,948) in view of STOKES et al. (US 6,528,439 B1).

OGINO et al. discloses an air-cleaning filter element prepared by applying a pressure-sensitive adhesive agent to at least a pair of three-dimensionally mesh-structured elastic-flexible webs, disposing evenly an adsorbent material, such as activated carbon between a pair of elastic-flexible webs and pressing the same elastic-flexible webs together as superimposed. (Abstract).

The reference further teaches that as regards the thickness of the mesh-structured elastic-flexible web, a web material may be sliced or otherwise processed to a thickness suitable for the grain size of carbon to be bonded thereto and the intended application. (Column 1, lines 65-68). The adhesive agent employed may be of any type if it is able to secure the adsorbent in position. The reference teaches the use of pressure-sensitive adhesives and methacrylate. (Column 2, lines 20-62)

OGINO et al. further teaches that the air-cleaning filter element can be prepared by the steps of applying the adhesive agent to mesh-structured elastic-flexible webs, disposing the adsorbent over the coated surfaces of the webs and bonding the webs together by the application of pressure. The application of the adhesive agent to elastic flexible webs can be accomplished by direct brushing, roller- or calender-coating, spray-coating or any other suitable procedure. (Column 3, lines 5-13) The

reference further teaches that the bonding of carbon to the adhesive-coated webs can be accomplished by supporting the webs between plates and applying an external load. (Column 3, lines 55-58)

The reference further teaches the use of a polyurethane foam to form the mesh-structured elastic-flexible web and that the density of the cells is selected according to the grain size of the activated carbon or other adsorbent employed. (Column 1, lines 53-64) Further, it teaches that the adsorbent is normally used as cylindrical, spherical or irregular-shaped grains from 0.5 mm to 10 mm, preferably from 1 mm to 5 mm in diameter. (Column 2, lines 12-15) It is noted that since present reference teaches the use of cylindrical and irregular-shaped grains, the claimed aspect ratios of claims 5-6 are met by the present teachings.

The OGINO et al. reference discloses the pressure drop for different samples of their invention at a flow rate of 1 m/sec as a liner flow rate. (Column 5, lines 33-47; Tables 2-5)

With regards to the claimed percent increase in pressure drop, these values are directly dependent on the thickness of the filter. The OGINO et al. reference teaches a filter that could be used for air cleaner and other uses and teaches that an appropriate thickness for the a mesh-structured elastic-flexible web can be selected within the range of 3 to 10 mm. (Refer to Column 1, lines 12-13 and Column 2, lines 1-3). Therefore, as regards to claims 17 and 18, values of 5 to 50 mm in the overall filter in view of the teachings of OGINO et al. would have been obvious to one of ordinary skill in the art, since the OGINO et al. reference teaches the use of two layers of the web. Further, the desired pressure drop of a filter is dependent on the intended use of the filter. It is well settled that determination of optimum values of cause effective variables such as increases in pressure drop of a filter is within the skill of one practicing the art. In re Boesch, 205 USPQ 215 (CCPA 1980).

It is noted that the comprising language of the present application does not preclude the use of more than one layer of a flexible support.

However, the reference does not disclose that the support web is formed of substantially nonlinear filaments that randomly intersect.

STOKES et al. discloses crimped polymeric fibers and nonwoven webs and laminates made from the fibers. The reference teaches the use of their nonwoven webs in filter media since the webs made according to the STOKES et al. reference have improved loft characteristics with low pressure drop. (Abstract; Column 4, lines 22-65). The reference further teaches that the fibers can be spunbond fibers, meltblown fibers, or staple fibers. The fibers can be naturally crimped or mechanically crimped. (Column 5, lines 25-30)

Since both OGINO et al. and STOKES are from the same field of endeavor, filters, the purpose disclosed by STOKES would have been recognized in the pertinent art of OGINO et al.

With regards to the open filter cells being random in size and orientation through the length and depth of the filter, these properties are inherent of structures such as foams and porous sheets produced from melt-blown fibers.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the three-dimensional mesh-structured web of OGINO et al. and provide it with a nonwoven web of crimped fibers to improve its fluid management properties and provide it with improved loft characteristics and a low pressure drop as discloses by STOKES et al. (Column 4, lines 27-65).

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over OGINO et al. (US 4,411,948) and STOKES et al. (US 6,528,439 B1) as applied to claim 1 above, and further in view of FUKUURA et al. (US 6,207,255).

OGINO et al. and STOKES et al. fail to teach that the adsorbent particles are free flowing. It is noted that the Examiner interprets the term "free flowing" as particles that are kept to be like afloat in the internal space of the web.

FUKUURA et al. discloses a sheet form adsorbent woven fabric with air cleaning and dust collecting air-conditioner or air-cleaner for household or car use, wherein featured are low pressure loss, long use life, and high cleaning performance by one passage with high air velocity. (Column 1, lines 10-15). The reference teaches the use of activated carbon particles adhered to the woven sheet, and further a three dimensional structure wherein the absorbent particles are kept to be like afloat in internal space so as to be suitable to treat with higher air passage rate with a minimum hindrance to permeability. (Column 2, lines 3-8)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the filter sheet and provide it with adsorbent particles that are kept to be like afloat in its internal space with the motivation of having a low packing density that will promote the contact efficiency between air and adsorbent when turbulent air (or gas) flow passes through it as disclosed by FUKUURA et al. (Column 1, lines 65 through Column 2, lines 1-8)

4. Claims 7-8 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over OGINO et al. and STOKES et al. as applied to claim 1 above, and further in view of VON BLUCHER et al. (US 4,906,263).

OGINO et al. and ~~BRAUN~~ STOKES et al. fail to teach filaments with diameters between 0.05-2 mm or that the support web is a coiled support web formed from substantially continuous filaments. Also, the references above fail to teach that the support web has a pore size on average from 1 to 10 mm. The prior art of record also fails to teach the relation of the diameter of the adsorbent particles in relation to the diameter of the pores of the support web.

VON BLUCHER et al. discloses an adsorption filter that has a highly air-permeable, three-dimensional carrier framework to which a layer of granular adsorber particles with a diameter of 0.1 to 1 mm is affixed with the distance between the wires, monofilaments or stays being at least twice as great as the diameter of the adsorber particles. Preferably, it is approximately three to ten time as great. Accordingly, the openings or pores of the carrier framework have a diameter of 1 to 5 mm, preferably 1.5 to 2.5 mm. If the highly air-permeable, three-dimensional carrier framework, essentially stable in shape, is composed of monofilaments or threads of plastic, glass or liquefied minerals, the diameter is preferably 0.2 to 1mm. (Column 1, lines 42-59) The reference further teaches the use of a carrier framework consisting of plastic or wire spirals. (Column 2, lines 5-7)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the filter sheet and provide it with a coiled structure with a pore size and the filament's diameter taught by VON BLUCHER et al with the motivation of creating an adsorption filter with low flow-through resistance and high adsorption performance as disclosed by VON BLUCHER et al. (Column 1, lines 37-41)

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

BRAUN (US 3,971,373) - discloses a self-supporting durable flexible conformable low-pressure-drop porous sheet product that contains a uniform three-dimensional arrangement of discrete solid particles. This sheet product comprises, in addition to the particles, a web of entangled melt-blown microfibers in which particles are uniformly dispersed. (Abstract)

The reference teaches that the sheet product of their invention has particles introduced into the gaseous stream carrying the microfibers and become intermixed with the microfibers. The particles

are held within the web. BRAUN further discloses that the particles in their sheet product are usually large enough to be physically entrapped within the interstices of the web. (Column 2, lines 19-41) The reference further teaches that the sheet products have low-pressure drops and other useful web properties including good durability. (Column 2, lines 59-60)

ROSENBERG et al. (US 6,423,123 B1)

GROEGER (US 5,662,728)

SENKUS et al. (US 5,696,199)

BELDING (US 5,212,131)

KASMARK et al. (US 5,124,177)

OGINO (US 4,296,166)

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 703-306-5714. The examiner can normally be reached on Monday-Thursday 8:30-3:00 pm and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

nlt
March 18, 2003

ELIZABETH M. COLE
PRIMARY EXAMINER